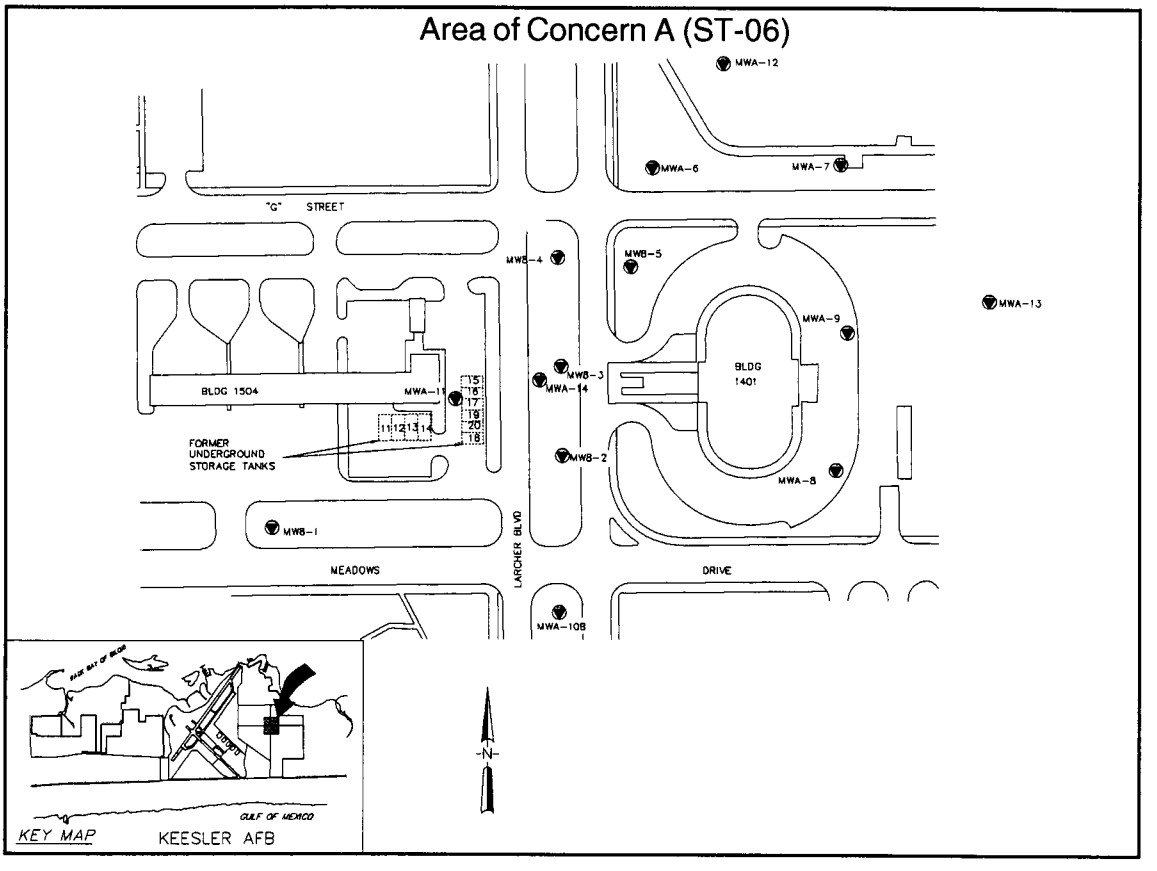
KEESLER AIR FORCE BASE
INSTALLATION RESTORATION PROGRAM
KEESLER AFB, MISSISSIPPI
Statement of Basis - AOC A (BX Service Station USTs)

IRP SITE DESIGNATION

BX Service Station USTs: RCRA Site Code AOC A, IRP Site Code ST-06.



INTRODUCTION

Keesler Air Force Base (Keesler AFB) is located within the city limits of Biloxi, Mississippi, on the peninsula bordered by the Back Bay of Biloxi and the Mississippi Sound. Area of Concern A (AOC A) is located at Larcher Boulevard and Meadows Drive. The station is currently active and includes service bays and pump islands. Underground Storage Tanks (USTs) are located at the western portion of the site and contain gasoline and diesel fuel. These tanks reportedly do not leak. In 1987, ten USTs, which were used to store automotive gasoline, were removed. Six of the tanks were located along the eastern side of Bldg. 1504 and four were just south

of the building. Physical evidence, such as stained soils, and high vapor readings observed during the excavation showed that one or more of the tanks had leaked in the past.

This paper, called a Statement of Basis, is part of the cleanup planning process and is a requirement of the RCRA permit issued by United States Environmental Protection Agency (USEPA). The proposed final remedy for AOC A is natural attenuation and long term monitoring with land use controls. Previous corrective action that has occurred at AOC A includes bioventing of soils and density-driven convection for soils and groundwater. These actions are discussed further in the RCRA Facility Investigation (RFI)/Group 1 Sites Report (April 1999) and the Corrective Action Plan (April 1999).

The information presented in this Statement of Basis summarizes the information obtained from previous investigations conducted at AOC A (ST-06). Detailed information concerning this SWMU can be found in the RFI (April 1999). This document is available in the Administrative Record. The Administrative Record is located at the information repository identified later in this Statement of Basis.

The public is encouraged to comment and participate in the remedy selection. The public is also encouraged to review the Administrative Record. The USEPA will select a final remedy for AOC A (ST-06) only after the public comment period has ended, and the comments received are reviewed and considered.

PUBLIC COMMENT PERIOD AND PUBLIC MEETING

The public is encouraged to provide comments regarding the corrective action alternatives provided in the Corrective Action Plan (April 1999) and supported by the RFI/Group 1 Sites Report (April 1999). In addition, the public may comment on any other corrective action alternatives, including those not previously evaluated. The public is also invited to provide comments on corrective action alternatives not presented in the above mentioned documents.

Important dates to remember

Public comment period begins:
January 13, 2000

Public comment period ends:
February 26, 2000

Please note, written comments must be postmarked no later than midnight, **February 26, 2000**. A public meeting will be held, if requested. During the public meeting, USEPA, the Mississippi Department of Environmental Quality (MDEQ), and the U.S. Air Force will be available to respond to oral comments and questions.

The Administrative Record for AOC A (ST-06) is available at:

Biloxi Public Library
Reference Section
139 Lameuse Street
Biloxi, Mississippi
Mon., Tue., Wed., 9 A.M. to 8 P.M.
Thu., Fri., Sat., 9 A.M. to 5 P.M.

Comments received will be summarized and responses will be provided in the Responses to Comments document. The Responses to Comments document will be prepared following the close of the public comment period. The comments and corresponding responses will be included with the final permit modification in the Administrative Record.

To request further information please contact:

Ms. Lisa Noble
Keesler AFB, Mississippi
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lisa.noble@keesler.af.mil

or

Mr. Robert Pope
U.S. Environmental Protection Agency, Region 4
(404) 562-8506
pope.robert@epamail.epa.gov

or

Mr. Bob Merrill
Mississippi Department of Environmental Quality
(601) 961-5049
bob_merrill@deq.state.ms.us

Submit written comments to:

U.S. Environmental Protection Agency
Attention: Mr. Robert Pope
US. Environmental Protection Agency, Region 4
Federal Facilities Branch
61 Forsyth Street
Atlanta, GA 30303

Comments must be postmarked no later than midnight, **February 26, 2000**.

PROPOSED REMEDY

The USEPA is proposing natural attenuation and long term monitoring with land use controls to address AOC A (ST-06), BX Service Station USTs. Long-term monitoring of the groundwater (5 years) will be completed to ensure that the attenuation processes are occurring as anticipated. The cost for implementing this alternative is approximately $150,000.

AOC A (ST-06) DESCRIPTION

AOC A is located at Larcher Boulevard and Meadows Drive. The station is currently active and includes service bays and pump islands. USTs are located at the western portion of the site and contain gasoline and diesel fuel. These tanks currently meet federally mandated upgrade requirements for UST systems and have not leaked. In 1987, 10 USTs used to store automotive gasoline were removed from the site. Six of the tanks were located along the eastern side of Building 1504, and four were located just south of the building. Physical evidence, such as stained soils, and high vapor readings observed during the excavation showed that one or more of the tanks had leaked in the past.

AOC A (ST-06) INVESTIGATIONS AND HISTORY

In 1987, the 10 USTs were removed from the site and soil samples were collected and analyzed for TPH and inorganic extraction procedure (EP) toxicity. Analysis of a soil gas survey collected in the former UST area indicated a hydrocarbon anomaly adjacent to the east-northeast side of the service station. Based on this information, five monitoring wells (MW8-1 through 8-5) were installed to evaluate potential groundwater contamination. MW8-1 is the upgradient monitoring well and MW8-5 is the down gradient monitoring well. Groundwater samples were collected from these wells in 1988 and 1989.

In 1992, an RFI was conducted at AOC A (ST-06). The RFI involved the installation of 13 borings and 8 monitoring wells (MWA-6 through MWA-13) for the collection of soil and groundwater samples. Soil and groundwater samples were collected at varying depths and distances from the suspected source areas in an attempt to estimate the extent of contamination. Soil samples obtained from the borings were evaluated for benzene, toluene, ethylbenzene, and xylene (BTEX) and total petroleum hydrocarbons (TPH) and groundwater samples obtained from the wells were evaluated for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), TPH and lead. A soil vapor survey was also conducted as part of the RFI effort. A Baseline Risk Assessment (BRA) was completed as part of this RFI.

The 1992 groundwater sampling event indicated that lead could potentially be of concern. However, the groundwater samples collected in 1992 exhibited high levels of turbidity. Based on the 1992 groundwater sampling results, groundwater was resampled in 1996 using the slow purge method of sampling to minimize the amount of particulate matter suspended in the groundwater. Groundwater samples collected in 1996 were analyzed for lead only. Lead was not detected in any of the 1996 samples.

In 1993, initial testing was conducted by Battelle-Columbus, Inc. for a bioventing system and six shallow vent wells (three extraction wells and three injection wells) were installed in the vicinity of the former USTs. Bioventing includes injecting air into the unsaturated zone of soils through wells to stimulate the microorganisms already present in the soil into degrading residual petroleum products. Confirmatory soil and soil gas samples were collected after one year of operation. It was determined that TPH concentrations in vadose zone soils were reduced by 78 percent and average TPH concentrations in soil gas were reduced by 89 percent as compared to initial concentrations.

A large-scale test of a Density-Driven Convection (DDC) In-Well Aeration System was performed by Wasatch Environmental in 1996. The primary objective of the DDC is to reduce saturated zone soil contamination because the previous bioventing system had already reduced vadose zone soil concentrations. Results of the preliminary confirmation sampling indicated a significant decrease in soil total TPH in the 7-10 feet soil interval.

In April 1999, a corrective action plan (CAP) was prepared and implemented. The objective of the risk-based remediation is to reduce the risk of specific chemicals to human health and/or ecological receptors such as animals or plant life. Two monitoring wells (MWA-10B and MWA-14) were installed during the field effort. MWA-10B was installed to replace destroyed monitoring well MWA-10.

AOC A (ST-06) Investigation Results

Chemicals detected in environmental media at AOC A include petroleum-related substances, such as BTEX, polycyclic aromatic hydrocarbons (PAHs) and lead. The highest concentrations of chemicals in both soil and groundwater were detected in the vicinity of the former USTs. In soils, concentrations of petroleum products were detected in SBA-17, SBA-18 and SBA-20. In groundwater, the highest concentration of petroleum products were detected in MW8-3 (for acenaphthene, the highest concentration was detected in MWA-11 in 1992).

SUMMARY OF AOC A (ST-06) RISKS

Soil and groundwater analytical results from the RFI Investigation were used to evaluate human health risks associated with exposure to contaminants in the affected media (RFI Report, April 1999).

For human health, USEPA Region 4 has established a target level below which derived cancer risks and non-cancer hazards are considered to be acceptable. Risks were evaluated for current industrial workers, future industrial and construction workers, and hypothetical future residents (both adults and children) and compared to the USEPA Region 4 target levels. Current receptors were assumed to be exposed to surface soils at the site.In the future, all receptors were expected to be exposed to contaminants in both surface and deep (subsurface) soil. In the future, excavation activities are assumed to result in deep soils being uncovered and brought to the surface, resulting in the deep soils becoming available for contact by the future workers. In addition, future industrial workers and hypothetical future residents were expected to be exposed to groundwater.

Using USEPA Region 4 methodology, Chemicals of Concern (COCs) were identified for the future industrial worker and hypothetical future residents. Although COCs were identified for the hypothetical future resident, it should be noted that, given the current use of the site and anticipated future use as an industrial area, it is highly unlikely that residential development will ever occur at AOC A. Although the hypothetical future resident is not expected to live at the site, this group was included in the risk assessment to allow a health-protective evaluation of the soil and groundwater at AOC A.

Human health COCs were not identified in subsurface soils from the human health risk assessment. In groundwater, COCs were identified using USEPA Region 4 guidance [total scenario cancer risk greater than or equal to 1×10^{-4} (one in 10,000) and total scenario hazard index (noncancer effects) greater than or equal to 1.0] for both the future industrial worker and the hypothetical future residents. The COCs included BTEX, and several SVOCs (2,6-dinitrotoluene, bis(2-ethylhexyl)phthalate, naphthalene, 4-methylphenol) for the hypothetical future residents. For the future industrial worker, COCs in groundwater included benzene and 2,6-dinitrotoluene. In addition, based on the ARAR comparison, TPH in both groundwater and subsurface soil and bis(2-ethylhexyl)phthalate in groundwater were identified as COCs at AOC A.

The COCs identified from the human health risk assessment for the future industrial workers are presented in the following table along with their associated cancer and noncancer risk. The future industrial worker is the most probable future on-site receptor at AOC A.

Medium	COC (1)	Maximum Detected (2)	Federal MCL (3)	MS MCL(4)	Exposure Routes (5)	Cancer Risk (6)	HQ (non-cancer) (7)
Groundwater	Benzene	$6 \times 10^{+0}$	7×10^{-2}	5×10^{-3}	Ingestion/ Dermal	7×10^{-4}	22
	2,6-Dinitrotoluene	5×10^{-3}	NR	NR	Ingestion	1×10^{-5}	0.05
	Bis(2-ethylhexyl) phthalate	1.2×10^{-2}	6×10^{-3}	6×10^{-3}	Exceeds ARAR	8×10^{-7}	0.008
	TPH	$4.7 \times 10^{+3}$	—	$1.8 \times 10^{+1}$ (8)	Exceeds ARAR	ND	ND
Subsurface Soil (mg/kg)	TPH	$1.7 \times 10^{+7}$	—	$1 \times 10^{+2}$(8)	Exceeds ARAR	ND	ND

(1) Chemical of Concern
(2) Maximum Detected Value. Units in mg/L (water) or mg/kg (soil).
(3) Maximum Contaminant Level, EPA 1996. Units in mg/L.
(4) Maximum Contaminant Level, MSDEQ 1991. Units in mg/L.
(5) Pathways of exposure resulting in a chemical being identified as a COC.
(6) Total risk = ingestion + dermal risk, where appropriate.
(7) Total Hazard Quotient = ingestion + dermal HQ, where appropriate.
(8) MSDEQ UST Regulations 1991. Units in mg/kg.
NR No MCL for this analyte.
ND Not derived given lack of appropriate toxicity values.

The risk assessment recommended that benzene in groundwater and TPH in groundwater and subsurface soil be considered COCs to be evaluated for remedial action (to be cleaned up). Both 2,6-dinitrotoluene and bis(2-ethylhexyl)phthalate were recommended to be eliminated from further consideration in the risk assessment given the uncertainties associated with them. Both 2,6-dinitrotoluene and bis(2-ethylhexyl)phthalate were eliminated as COCs for the future industrial worker given the uncertainty of the data used in the risk assessment (they were only detected in 1/14 samples and the one detection was an estimated value).

The maximum detected concentrations (MDCs) of the COCs identified from the human health evaluation for the future industrial worker and recommended cleanup values are presented below for groundwater:

COC	MDC Groundwater (mg/l)	Recommended Cleanup Level (mg/l) (1)
Benzene	6	0.09
TPH	4,700	18

(1) - The recommended cleanup values are defined as the cleanup levels associated with carcinogenic (risk level = 1×10^{-5}) and noncarcinogenic (HQ = 1) effects.

As indicated in the table above, both benzene and TPH exceeded appropriate cleanup levels in groundwater.

In subsurface soil, the maximum detected concentration (1.7×10^{7} mg/kg) exceeded the UST regulation of 100 mg/kg. The TPH in subsurface soils, however, was detected in 1992, prior to the

bioventing and DDC efforts. The results of both of these actions resulted in significantly lower concentrations of TPH in the soil. The TPH remaining in the soil, therefore, is expected to biodegrade naturally.

An ecological characterization was performed to evaluate pathways for exposure of wildlife and vegetation to site contaminants (RFI Report, April 1999). The conceptual model indicated that there are no complete exposure pathways at this site. The site and surrounding area are developed, therefore, a baseline ecological risk assessment of the site was not conducted.

CORRECTIVE ACTION SCOPE

The Corrective Action proposed in this Statement of Basis was selected based on the results of the RFI report (April 1999) and the Corrective Action Plan (April 1999). For groundwater, the selected remedial alternative consists of natural attenuation and long-term monitoring with land use controls; soil remediation will consist of natural biodegradation processes. Consituents that will be monitored in groundwater include BETX and MTBE. These actions are intended to be the only corrective action taken at AOC A. Land use controls would prevent future development of the site and also prevent the usage of site groundwater by potential human receptors. The selected action poses no threat to human health or the environment based on current site conditions. Annual reporting of the groundwater sampling results and site status are required as part of the remedy.

CURRENT ACTIVITIES AT AOC A (ST-06)

The RFI has been completed for AOC A and a RFI report has been submitted to the regulatory agencies as Final in April 1999. The CAP for AOC A was submitted as Final in April 1999. The CAP and this Statement of Basis will be submitted to the public for comments. Quarterly monitoring, as part of the Long-Term Monitoring, was initiated in June 1999. Three quarterly sampling events have occurred. The site will progress into annual monitoring after one year of quarterly monitoring.

CORRECTIVE ACTION ALTERNATIVES SUMMARY

The HHRA for AOC A (ST-06) identified groundwater (COCs benzene and TPH) as the primary media of concern that poses human health risks to future receptors (hypothetical adult and child residents and industrial workers). In addition, TPH in subsurface soil was identified as a chemical of concern. The high concentrations of TPH detected in soils, however, were found in the 1992 sampling round. The majority of the TPH in soil, however, has been addressed by the bioventing and DDC actions that were completed in 1993. Natural attenuation (natural breakdown) of the remaining TPH in the soils is expected to occur.

For groundwater, the selected remedial alternative consists of natural attenuation and long-term monitoring with land use controls. Monitoring of groundwater for BETX and MTBE will provide a reliable confirmation of natural degradation of the contaminants or it can provide an early warning to detrimental changes in groundwater concentrations. The corrective action alternatives are the only alternatives considered for AOC A (ST-06) because no individual Corrective Measures Study was completed for this site. Land use controls would prevent future development of the site and also prevent the usage of site groundwater by potential human receptors.